

NOTES

THE subscription opened by the Paris Academy of Sciences for raising a statue to M. Becquerel, the celebrated electrician, is almost closed, having produced 15,000 francs; only 1500 francs more are required. Those wishing to subscribe should send their contributions to M. Maindron, at the Academy of Sciences, as early as possible.

LAST week M. Moll, the *doyen* of the Professors of the *Conservatoires des Arts et Métiers*, died in Paris. He was the oldest teacher of agriculture and one of the first, having been one of the staff of the celebrated Rouville *ferme-école*, established about sixty years ago.

THE Nestor of German bryologists, Prof. Ernst Hampe, died at Helmstedt on November 23 at the age of eighty-five years.

ON Nov. 23 the first section of the St. Petersburg Academy of Sciences (physico-mathematical sciences) had to choose a member in chemistry, and an influentially-signed presentation recommended Prof. Mendeleeff to the choice of the Academy. The Academy would certainly have done itself honour in choosing a man of such eminence in science, but we regret that Prof. Mendeleeff was not elected. This is held locally to show that the Academy is influenced in its selection by other reasons than the value of a candidate's scientific work. The impression on the public in general, we believe, is very unfavourable to the Academy; not a day passes, we are informed, that Prof. Mendeleeff does not receive letters and telegrams from men eminent in science expressing admiration for his works. Many scientific societies have made him an honorary member, and only the other day the University of Moscow did the same.

AN interesting collection is being made by M. Dumas of medals commemorative either of scientific men or scientific discoveries. The number already collected is far greater than had been expected.

LIEUT. JULIUS PAYER, one of the leaders of the Austrian North Polar Expedition of 1872-74, has settled at Munich with the intention of devoting himself exclusively to the art of painting.

THE central committee for the erection of a Spinoza monument at the Hague have, before their dissolution, resolved to utilise the remaining balance of funds in their hands for publishing a new and handsome edition of the complete works of the great philosopher. Doctors J. van Vloten and J. P. N. Land have been commissioned to prepare the new edition. In the interest of this laudable undertaking the friendly request is now addressed to all librarians and possessors of autographs to communicate with these gentlemen regarding any autographs of Spinoza which may be in their possession, in order to render the edition as complete as possible. Communications are to be addressed to the publishing firm of Martinus Nijhoff at the Hague.

A STRONG shock of earthquake was felt at Wiesbaden on the night of the 8th instant, at eleven o'clock; the shock was directed from north to south. A strong subterranean noise preceded it, and a violent wind of short duration was observed. Another shock is reported from Saxony. A fresh violent shock lasting two seconds occurred at Agram at twenty-seven minutes after midnight of the 7th. Subterranean rumblings followed the shock and continued to be heard throughout the night. As on the last occasion the shock was accompanied by distant storms and preceded by a slight vibration. On Wednesday night last week there was a strong earthquake shock at Agram which lasted six seconds. It was preceded by a loud rumbling. On the day previous the earth trembled for an hour together. That of Wednesday night was the strongest shock

since the first. Two walls fell in and the houses shook. On Thursday evening last six slight shocks were felt at Vienna. At Agram there were two violent shocks at half-past two and half-past three o'clock in the morning. A shock of earthquake was felt at Brescia on the afternoon of the 10th, accompanied with a rumbling noise.

PROF. RUDOLPH FALB gave a lecture in the Vienna Gewerbe Museum on November 27, in which he said that earthquakes are subterranean volcanic outbreaks, produced by the cooling action of the hot liquid interior of the earth and the attraction of the sun and moon. In support of this view he urged that most earthquakes occur at the time when the sun is nearest us, viz., in January, fewest in June; also the number of earthquakes increases in the months of April and October, because of the stronger attraction of the sun on March 21 and September 23. He said further that in the period December 16-30 this year fresh earthquakes might occur at Agram.

A NEW and somewhat bold hypothesis as to the cause of earthquakes has been propounded by Dr. Novak in Pesth. He considers that, besides the rotation of the earth on its axis and its revolution round the sun, a multiplicity of motions of the earth appear in space, in virtue of which the earth's axis, and with it the equator, shift their position. This causes a variation of the forces influencing the earth's form (centrifugal and centripetal force), and the earth has the tendency to adapt itself to this change. He also considers a change of form of the earth to occur through the shifting of the pole and the equator, and that this may have effect some time afterwards, where the earth's crust is weak.

WE are requested by the Sunday Society to announce the following arrangements for the Sunday opening of the Winter Exhibition of Oil Paintings at the Hanover Gallery, New Bond Street, by permission of the proprietor, Mr. Weil. On Sunday, December 26, the Gallery will be open to the Members of the Society, and on the two following Sundays the public will be admitted by free tickets, which will be issued to those applying by letter and sending a stamped and addressed envelope to the Honorary Secretary, 8, Park Place Villas, W. On each Sunday ticket-holders will be admitted from 4 o'clock till 7.30 p.m., and the gallery will be closed at 8 o'clock. On the reassembling of Parliament the Society will press its claims upon both Houses of the Legislature by bringing forward the following resolution:—"That inasmuch as all opposition to the action of Her Majesty's Government in opening on Sundays the National Museums and Galleries in the suburban districts of London and in Dublin has entirely ceased, owing to the good results which have followed such opening, this House is of opinion that the time has now arrived for extending this action to all institutions of a like character, it having been most conclusively shown that large numbers of the people rejoice in every opportunity that is afforded them of spending Sunday intelligently and with due regard for its preservation as a day of rest and cessation from ordinary work and amusement."

SOME information regarding the observatory at Nice, now in course of construction through the munificence of M. Bischoffsheim, is given by M. Tissandier in *La Nature*. Some 35 hectares of ground have been acquired. The situation is a few kilometres north-east of Nice, near the road from Corniche over the Mont des Mignons (or Mont Gros), and 375 m. above the sea. There are to be two large dwelling-houses for astronomers and for accommodation of visitors. One is already finished, and M. Thollon has there done some excellent work in spectroscopy. More than 250 workmen are at present busy on the buildings. Some of the instruments will shortly be ready. The whole is being organised under the auspices of the Bureau des Longitudes.

The Observatory will comprise at first two equatorials, one meridian, and several accessory instruments. One of the equatorials will probably be the largest astronomical apparatus in the world. Its focal distance will be 18 metres, and its aperture 0.76 m. The cupola will have a diameter of no less than 22 m. The construction of the object-glass is entrusted to MM. Paul and Prosper Henry of the Paris Observatory. The instrument alone will cost about 250,000 francs, and the cupola will be correspondingly expensive. The total cost of the Observatory will exceed two million francs.

AN interesting pamphlet on the subject of the introduction of hypotheses in school education has been published by Dr. Hermann Müller of Lippstadt (Bonn, Strauss). Dr. Müller writes in self-defence and in reply to Prof. Virchow, whose controversy with Prof. Hæckel on this subject some years ago will be remembered.

AMONG other useful matter in the "British Almanac and Companion" for 1881 is a summary of the science of the past year, by Mr. J. F. Iselin, which is good so far as it goes, but that is necessarily not very far. There is also an article on "Weather Forecasting," by Mr. R. H. Scott, and a "Sketch of the History of the Royal Observatory, Greenwich," by Mr. W. T. Lynn.

THE Report of Mr. Morris, the Director of Public Gardens and Plantations in Jamaica, on the financial results of the last consignment of Cinchona barks sent to the London market, is extremely satisfactory, inasmuch as it shows the superiority of Jamaica barks over those of Ceylon, as indicated by the prices realised. The consignment referred to in the present Report consisted of eighty-one bales, in which the several species under cultivation were represented, crown bark from *C. officinalis* and red bark from *C. succirubra* forming by far the largest proportion. The total amount realised for these eighty-one bales was 1313*l.* 11*s.* 7*d.* For all the different kinds, whether "quill," "trunk," "root," or "twig" bark, the prices realised were in excess of those obtained for the same kinds of Ceylon barks, to the extent even in some cases of 2*s.* 9*d.* per pound. Mr. Morris draws attention to the fact that from the recent sales the relative merits of the two principal species under cultivation, namely, the crown or grey bark (*C. officinalis*) and the red bark (*C. succirubra*) have become very distinctly marked. The first-named species has proved to be a most valuable product, and whatever changes and fluctuations may ultimately take place in view of the more extensive cultivation of Cinchona in different parts of the world, high-class bark of this nature must always command good and remunerative prices. The conclusion arrived at is that the conditions of soil and climate of certain parts of Jamaica are "eminently favourable to the production of the best qualities of these valuable products, and as large tracts of land and the necessary labour are now available, there are only wanting sufficient capital and energy to overcome the initial difficulties of this enterprise."

THE buds of the second vegetation in Paris which we noticed in October were killed by the frosty weather in the beginning of November, but a new vegetable phenomenon has been seen in the Champs Elysées. Owing to the exceptional hot weather prevailing in December new leaves have been observed on a few trees, and were flourishing at the date of our most recent observations.

THE Bill relating to the forthcoming exhibition of electricity in Paris has been presented to the Chamber. M. Cochéry asks for a credit of 300,000 francs—150,000 for the exhibition and 150,000 for the Congress and experiments. A guarantee fund of 20,000*l.* has been signed by fifty persons.

A USEFUL pamphlet on Bedroom Ventilation has been published by Mr. Lawson Tait of Birmingham.

THE *American Entomologist* has been incorporated with the *American Naturalist*.

THE rare phenomenon of an inverted rainbow was observed at Innsbruck on November 25 at 8.45 a.m. The end-points of the semicircle, the centre of which was the sun, rose and moved westwards with the latter for some thirty minutes. The phenomenon then vanished.

A VALUABLE discovery has been made at Jochenstein, near Obernzell (Bavaria). A farmer of Jochenstein had frequently noticed a stone plate, of some 1½ metres square, in the centre of a wood belonging to him. He had the plate raised recently, and under it were found six head-rings, four spiral bracelets, each showing nine twists, and two battle-axes. All the objects are of bronze and capitally preserved.

THE second part of "The Scientific English Reader" (Leipzig, Brockhaus), edited by Dr. F. J. Wershoven, the first part of which we have already referred to, contains extracts relating to machinery and mechanical technology.

THE fourth part of Dr. Dodel-Port's excellent "Atlas of Physiological Botany" has just been published. The six plates it contains are in every respect equal to those of the former numbers. They comprise (1) *Volvox minor*, germ-history of the oospore (this plate forms the supplement of the *Volvox globator* plate in part 1); (2) *Equisetum Telmatega*, sporangia and spores; (3) *Passiflora corulea* and *P. corulea-alata*; (4) *Selaginella helvetica*, with macro- and microsporangia, macro- and microspores; (5) *Polytrichum gracile*, male and female plants, moss-fruit and its anatomy, spores and germinating spores; (6) *Narcissus poeticus*, seed-bud in longitudinal section at the time of fertilisation. These drawings are made according to the latest researches on the fertilisation of phanerogamic plants. Parts 3-5 of the same authors' "Illustrirtes Pflanzenleben" will also shortly be published.

AMONG the special papers in the *Annuaire* of the Brussels Observatory for 1881 are the following:—"What is the Climate most favourable to the development of Civilisation?" "Physical Phenomena accompanying the Transits of Mercury," by M. Niesten; "Nomenclature of existing Public Observatories"; "The Asteroids," by M. Niesten; "The Isthmus of Panama."

THE last Calcutta *Gazette* contains some official correspondence regarding the insect lately discovered in Monghyr, which threatens to become very destructive to the rice crops. The specimens forwarded to Mr. Wood Mason, deputy superintendent of the India Museum, have been identified by him as belonging to the genus *Cecidomyia* and as related to the Hessian fly which ravaged the wheat-fields in the United States. This genus, Mr. Mason says, has never before been found in India, and he proposes to call the species *Cecidomyia oryza*, or the rice-fly. He goes on to say that it is likely to prove a most formidable pest, and recommends that the district officers should be instructed to make further inquiries and carefully watch its progress.

A RECENT number of the *Golos* contains an interesting letter from Tiflis describing the enormous labour bestowed during the summer upon the destruction of the grasshoppers. The work was carried on for about three months, and occupied in one district (Gori) no less than 20,000 people per day. More than half these people had been summoned from the neighbouring districts of Achalzych, Ossetia, and Imeretia. Thanks to the colossal efforts thus made only 2 per cent. of the total crops of the district were destroyed by the grasshoppers. Many million roubles worth of hay and corn were saved by this work. On the other hand the organisation of the whole cost the Russian Government some 200,000 roubles, and many thousand acres of fields and gardens have been utterly neglected by the population to whom they belong.

A RHENISH Fishery Society has just been founded at Cologne. It will direct its attention not only to the Rhine fisheries, but its programme is a most universal one, comprising even the furtherance and support of ichthyological research as well as the establishment of ichthyological stations in various countries.

MR. BALLER of the China Inland Mission has lately made a journey in the little-known province of Kweichow at the time when the people were engaged on their opium harvest, and he thus describes the process:—A small three-bladed knife is used to make an incision in the poppy-head as soon as the petals fall off. The drop or two of milky juice that oozes out is after a little while scraped off with a small curved knife into a bamboo tube, and a fresh incision made. The process is repeated until the supply is exhausted. The juice thus collected is dried in the sun, when it turns jet black, and is then ready for the market.

OUR ASTRONOMICAL COLUMN

THE COMETS OF HARTWIG AND SWIFT.—MM. Schulhof and Bossert have investigated the elements of comets 1880 *d* and *e*, discovered respectively by Dr. Hartwig at Strasburg on September 29, and Mr. Lewis Swift at Rochester, New York, on October 11. Prof. Winnecke had conjectured that Hartwig's comet might have been identical with the comets of the years 1382, 1444, 1506, and 1569, with a period of revolution of 62½ years. MM. Schulhof and Bossert formed six normal positions between September 30 and November 29 from observations at Paris, Strasburg, Berlin, Leipsic, Kiel, Kremsmunster, Lund, Florence, Marseilles, O'Gyalla, Clinton, and Washington, and on varying the distances from the earth at the first and fifth place until the other normals were represented as closely as possible, arrived at an elliptical orbit, but with a period of 1280 years: this result is necessarily uncertain under the circumstances, but it nevertheless appears to render so short a revolution as 62½ years in the highest degree improbable.

With respect to Swift's comet, taking as the fundamental data the Odessa observation on October 31, a mean of Dunecht, Paris, and Strasburg on November 9, and an observation at Paris on November 27, it is found that, assuming only one revolution to have been accomplished between 1869 and 1880, or that the period is 10·96 years, the middle place cannot be represented with sufficient precision; when the error is diminished in longitude, it is increased in latitude. On the hypothesis that the period is 5½ years, or that two revolutions are included in the above interval, the error in latitude is greatly diminished, but still exceeds thirty seconds of arc. This, while indicating that the second hypothesis is more probable than the first, is regarded by MM. Schulhof and Bossert as rendering so short a period as 3½ years possible, though it is admitted that it may well be due to errors of observation. It must be borne in mind that the comet has always presented itself as a faint diffused object, without that degree of condensation necessary to insure precise observation. The following is the ellipse of 5½ years' period:—

Perihelion passage, 1880, November 8·00011 G.M.T.

Longitude of perihelion	43° 4' 33"	} M. Eq. 1880·0
" " ascending node	296° 51' 33"	
Inclination	5° 23' 32"	
Angle of eccentricity	41° 3' 25"	
Logarithm of semi-axis major	0·492684	

With these elements the perihelion distance will be found to be 1·0671, and the aphelion distance 5·1518, and the heliocentric latitude at aphelion — 4° 6' 6", whence we find the distance from the orbit of Jupiter to be 0·53.

MM. Schulhof and Bossert propose to continue their investigation when further observations are available: meanwhile it may be remarked that their ellipse of five and a half years is likely to afford positions sufficiently near the truth to insure the observation of the comet as long as it is within reach of our telescopes, and it may be suggested to those who are in possession of powerful instruments that they will render an important service in determining places of this comet as long and as accurately as practicable.

THE NOVEMBER METEORS.—Notwithstanding much interference from clouds the observers at Moncalieri, who watched for meteors during the nights of November 12-14, consider that

they obtained evidence of the increasing density of the Leonid-stream, thus confirming observations made last year in England and the United States. One of these meteors appeared larger than the planet Jupiter, with an intense blue light, and a bright train of the same colour. It is added: "La lumière zodiacale d'opposition était très brillante vers l'orient, sur le fond pur de ciel, s'élevait jusqu'au delà de la queue de Lion."

NEAR APPULSE OF JUPITER TO A FIXED STAR.—On the evening of November 20 Jupiter must have approached very near to the star B.D. + 2° No. 97, rated 7·7 in the *Durchmusterung*, and 7·9 on December 17, 1856, when it was observed on the meridian at Bonn, indeed the resulting place of the star would bring it almost into contact with the limit of the planet about the time of conjunction in right ascension (9h. 4m.), but small errors of the star's position and tables of Jupiter may have combined to leave it at an appreciable distance from the limb; perhaps some reader of NATURE may have determined micrometrically the nearest approach. The apparent place of the star on November 20 was in R.A. oh. 38m. 49·44s., Decl. + 2° 32' 59"·9.

BIOLOGICAL NOTES

ANABÆNA LIVING IN BOTRYDIUM.—It is now well known that many plants belonging to the group of the Nostocs flourish within the cells of other plants. Thus they are to be found in the petioles of the leaves of Gunnera, in Lemna, in Anthoceros, in Blasia, and in Azolla; and it was to be expected that they would equally find themselves at home in the cells of even more lowly organised plants. An instance of this latter, not without interest, has been noticed by Dr. L. Marchand, who recently collected a Botrydium at Montmorency, which, on being examined under the microscope, was found, instead of containing the usual mass of granular chlorophyll, to be filled with a chain of moniliform filaments, presenting all the characters of the chaplets of a Nostoc or Anabæna. These filaments were composed of cells, some oblong with yellowish heterocysts, and they did not fill the entire cavity of the Botrydium cell, but seemed to adhere to its inner walls. The Botrydia plants were perfect; the root-like prolongations, as well as the rest of the plant, were perfectly closed. How then did these foreign bodies get in? This is not a question easy to answer, but it is one well worthy of being investigated. Dr. Marchand calls attention to the remarkable figure of Mr. E. Parfitt in "Grevillea" (vol. i. p. 103, pl. vii.), in which there is now little doubt, with the light thrown on the subject by Dr. Marchand's specimens, that there is represented our common species of Botrydium with a parasitic, or better, an endophytic Anabæna. No doubt the cells of the Anabæna in Parfitt's figure are badly represented, but the observation made in Parfitt's paper would seem now not to be without a special interest of its own.

MESEMBRYANTHEMUM NOT MESEMBRYANTHEMUM.—Prof. Asa Gray, in the *Botanical Gazette* (Indiana), vol. v. Nos. 8 and 9, p. 89, thus writes:—This word is properly written Mesembrianthemum, by Jacob Breyne, who made the name, and by Dillenius, who took it up, both giving the derivation from *Mesembria*, mid-day, alluding to the time in which the blossoms open. But both Breyne and Dillenius themselves very often wrote it Mesembryanthemum; Linneus, adopting this latter, became consistent by making a wrong and far-fetched derivation to match the orthography. Among systematic writers Sprengel almost alone keeps to the correct orthography, but Webb insists on it. The younger Breyne, in his edition of his father's "Prodromus," has a note about it (p. 81). He mentions an excuse for changing the orthography, namely, "that some species do not open their blossoms at noontide," but intimates that Linneus' derivation from the insertion of the corolla around the middle of the germ is open to the same objection. Prof. Asa Gray adds, "if heeded, this kind of objection would be fatal to very many generic names."

CHLOROPHYLL IN THE EPIDERMIS OF PLANTS.—Adolf Stohr contributes to the *Scientific Proceedings* of the Vienna Academy a very interesting paper on the occurrence of chlorophyll in the epidermal tissue system of the leaves of flowering plants. He sums up a detailed account as follows:—While the epidermis of the aquatic submerged Phanerogams is usually regarded as containing chlorophyll, the epidermis of the green organs of the terrestrial Phanerogams is, on the contrary, considered to be